MERRA

Performance: Clouds & Radiative Forcing

5 September, 2006

MERRA
Requirement to justify proceeding -- advance upon ERA-40

- Improved treatment of changing observing system
  - SSMI jump evident in other reanalyses has to be reduced
  - Strategy: retrospective bias correction through the model for MERRA

- Improved Hydrological cycle
  - ✓ Minor tuning remains but Tropical Precipitation and TPW already an improvement on era-40
  - ✓ Improved cloud-radiation interaction and surface/TOA radiative budgets
  - Improve monsoon precipitation
  - Is vertical distribution of moisture good enough?
  - Can we use precipitation data more effectively?

- Surface
  - Surface temperature has warm bias (currently no surface analysis)

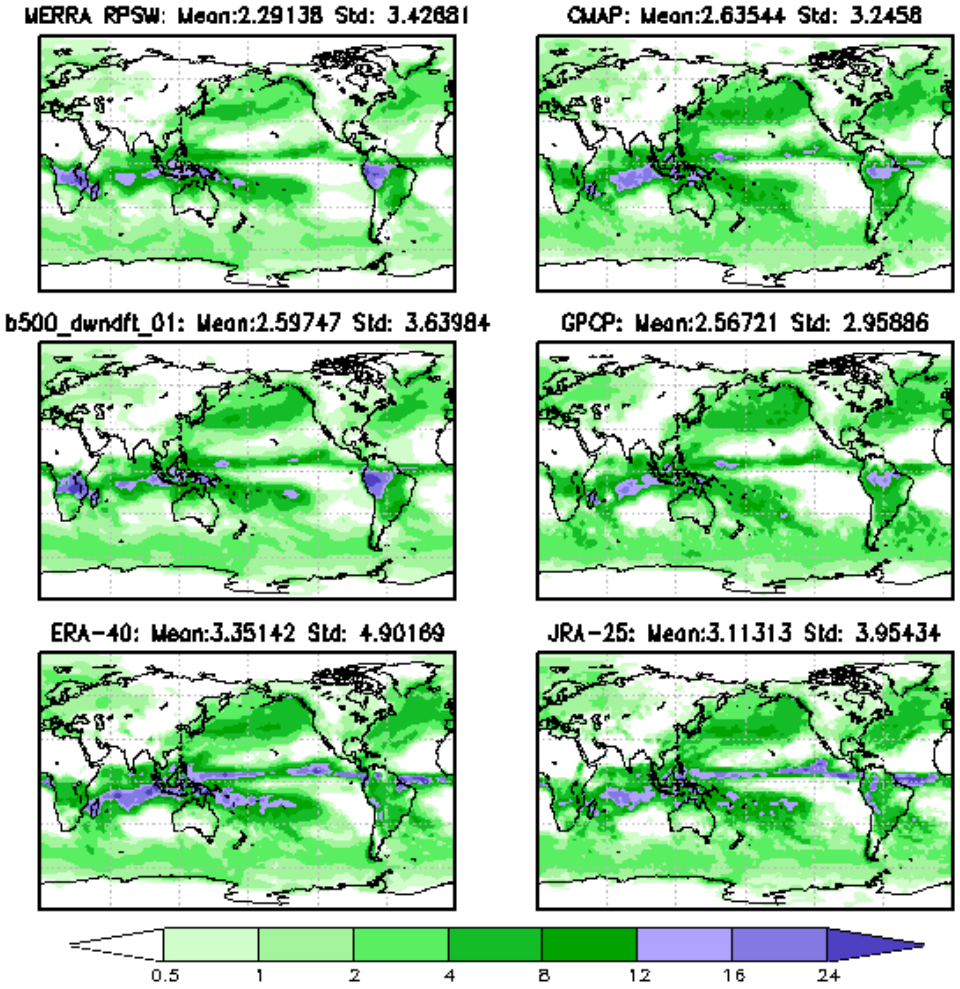
✓ Improved stratospheric analysis
  - ✓ fully resolved middle atmosphere - an advance on era-40
  - ✓ fully interactive ozone - an advance on era-40
  - ✓ stratospheric transport less noisy than era-40

2° MERRA tests

January 2001 Precipitation (mm/day)

MERRA_v0

MERRA_v1

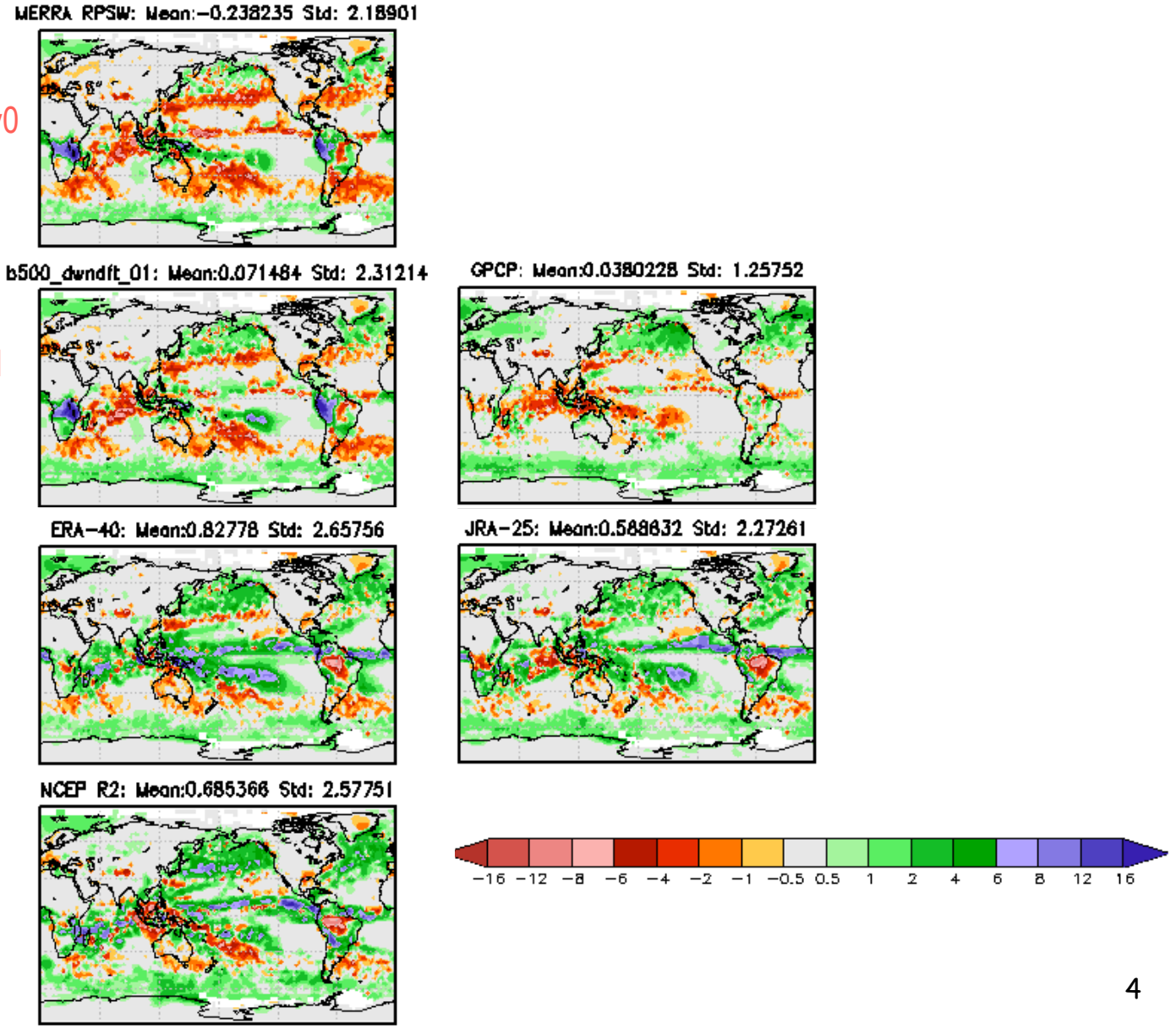


2° MERRA tests

January 2001 Precipitation - CMAP (mm/day)

MERRA_v0

MERRA_v1

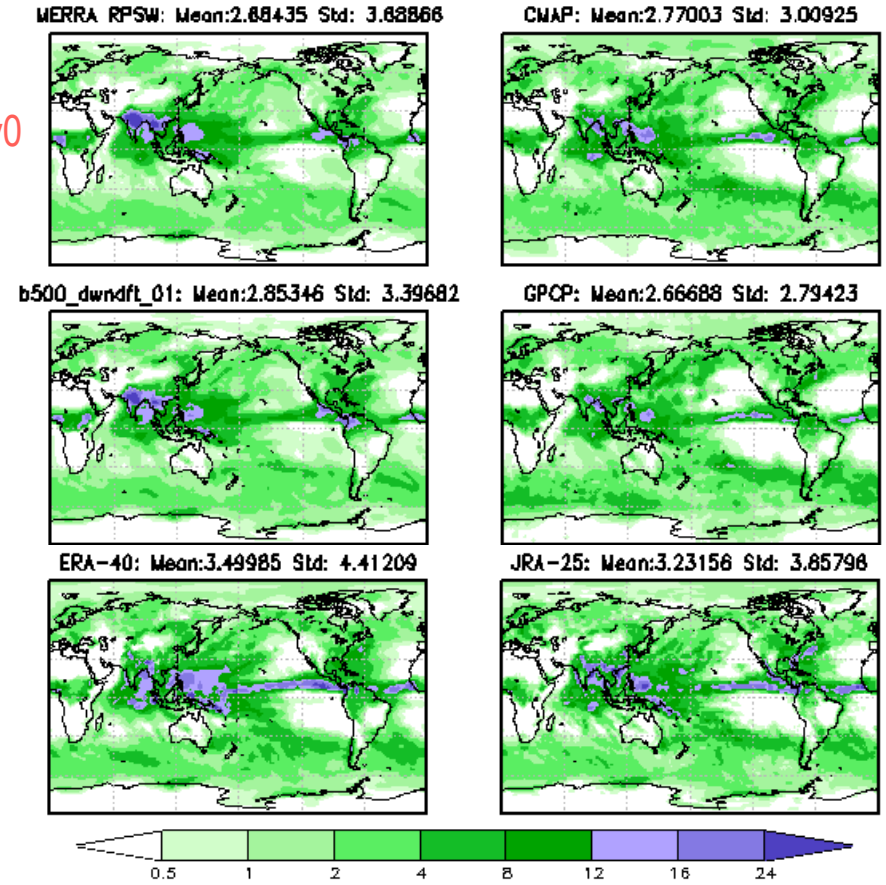


2° MERRA tests

July 2001 Precipitation (mm/day)

MERRA_v0

MERRA_v1

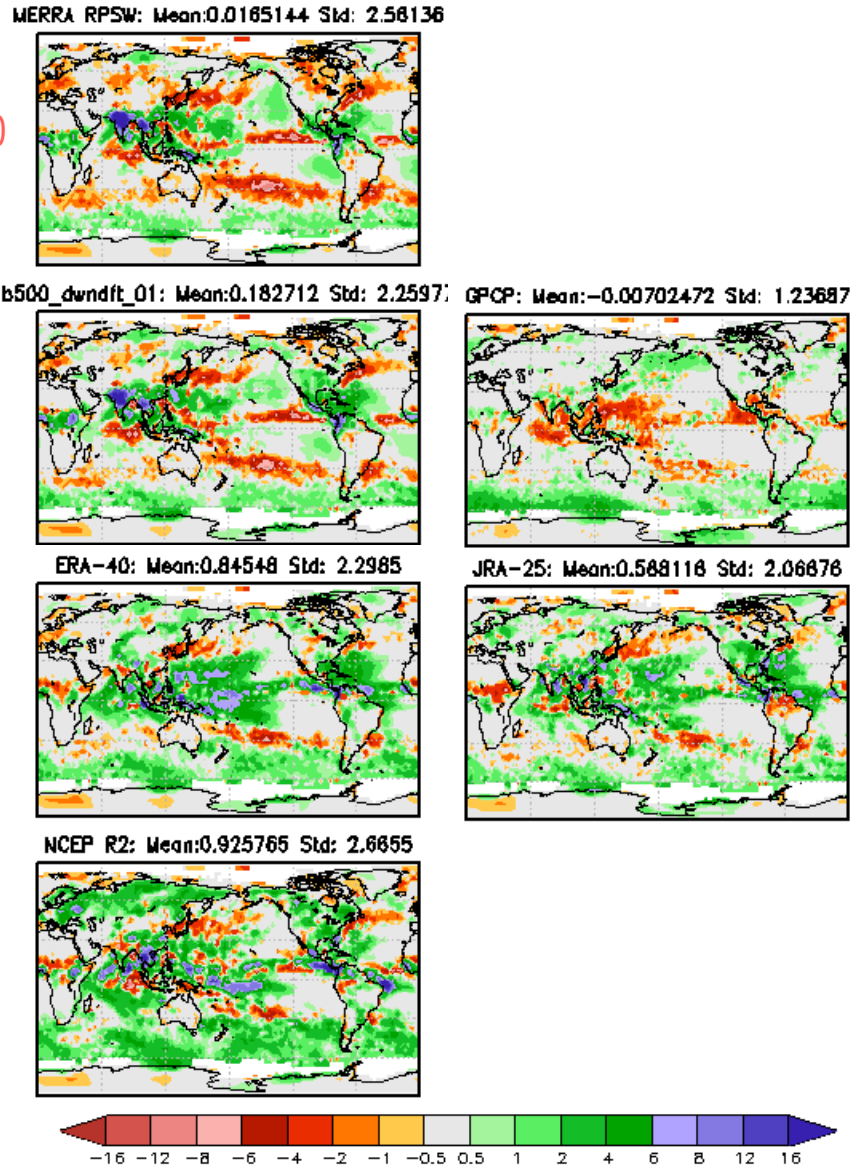


2° MERRA tests

July 2001 Precipitation - CMAP (mm/day)

MERRA_v0

MERRA_v1

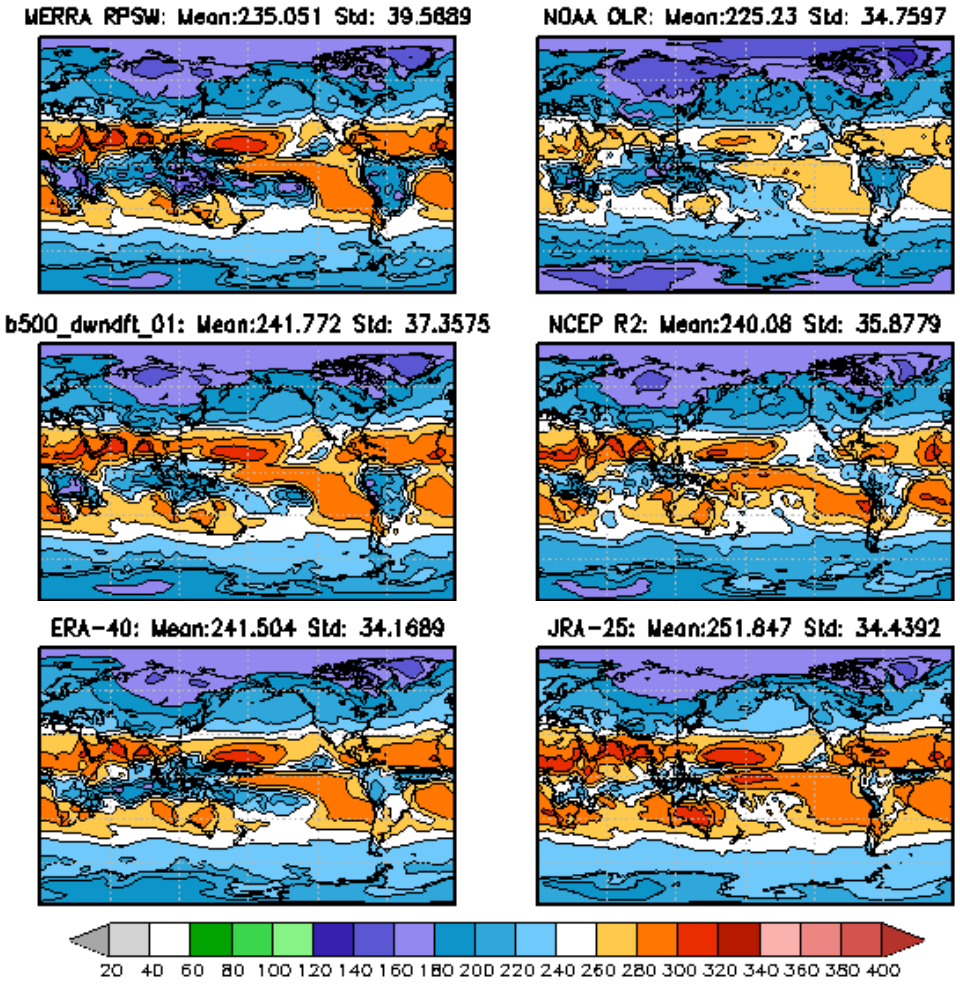


2° MERRA tests

January 2001 OLR (Wm^{-2})

MERRA_v0

MERRA_v1

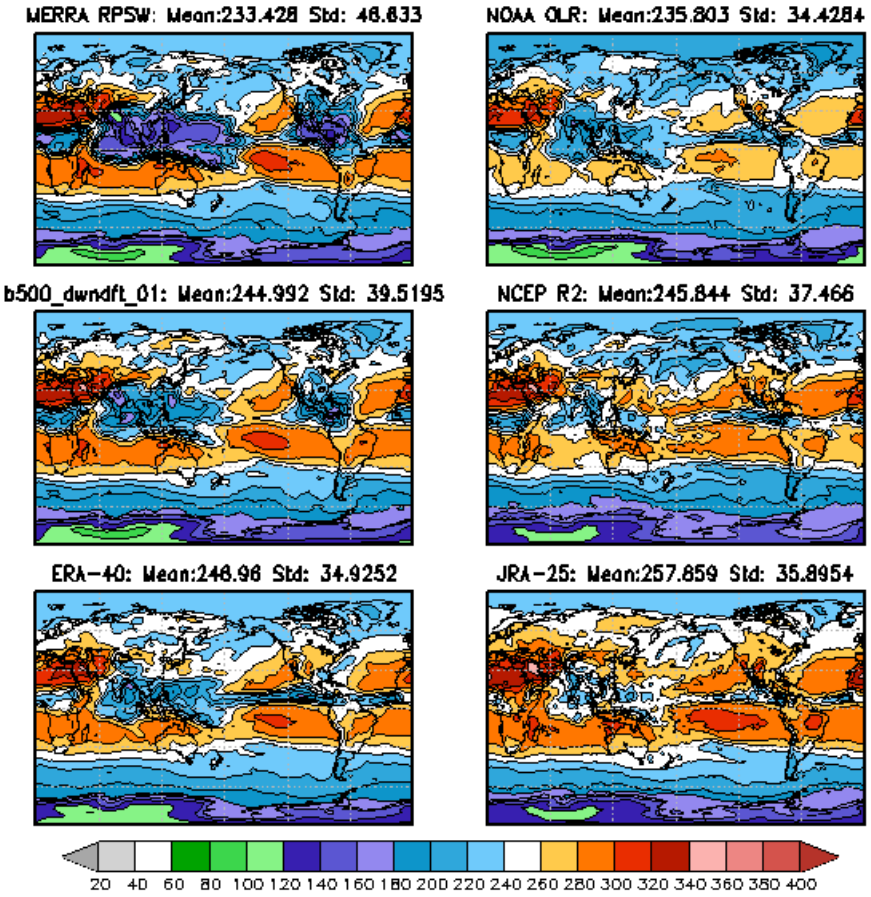


2° MERRA tests

July 2001 OLR (Wm^{-2})

MERRA_v0

MERRA_v1

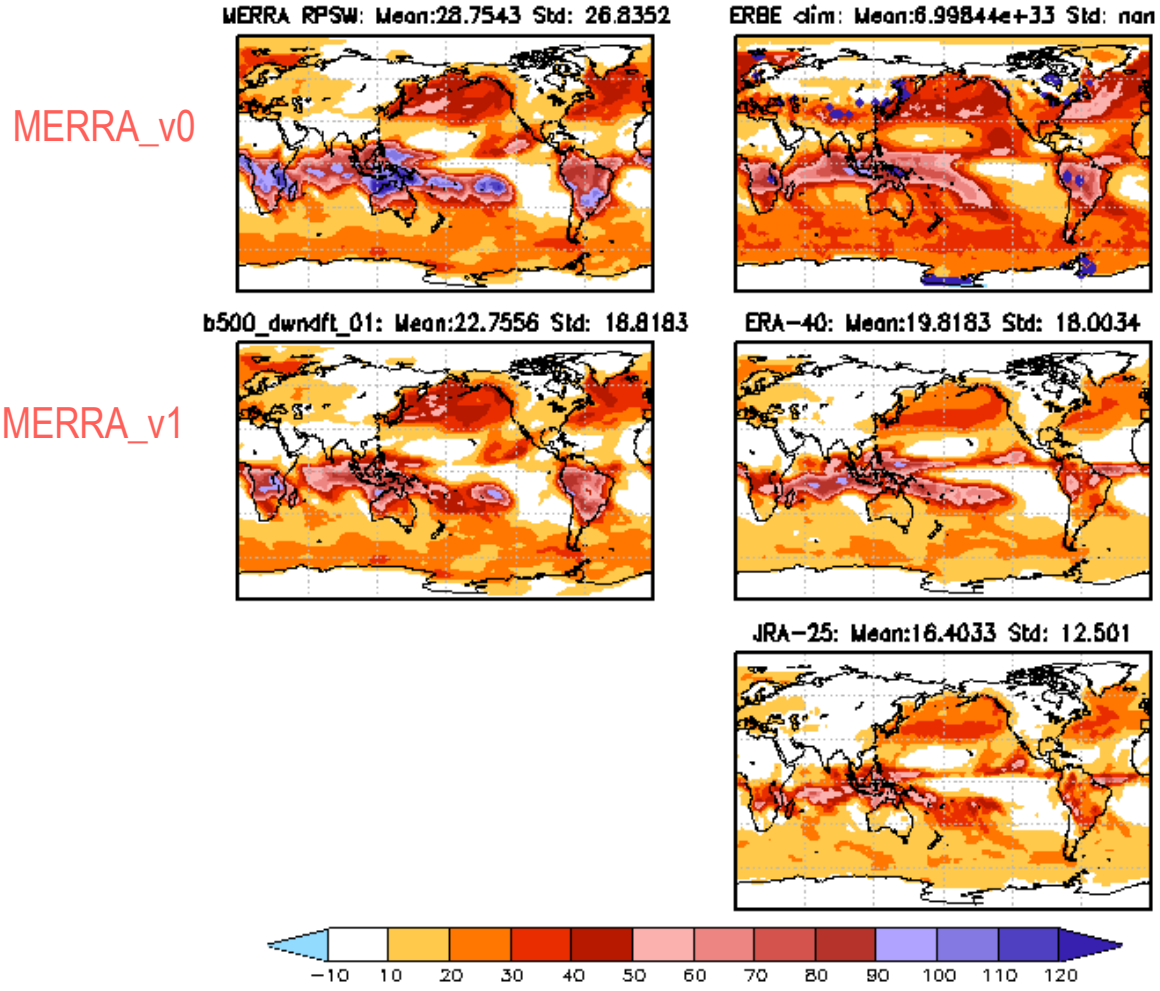


2° MERRA tests

January 2001 LW CRF (Wm^{-2})

MERRA_v0

MERRA_v1

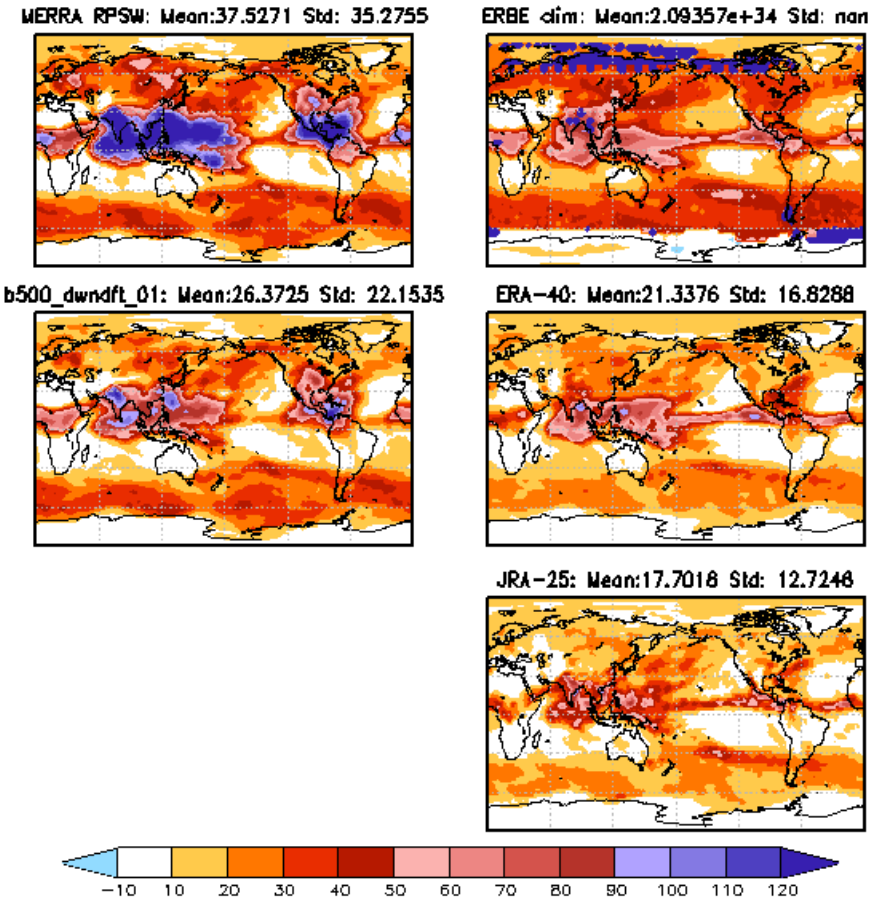


2° MERRA tests

July 2001 LW CRF (Wm^{-2})

MERRA_v0

MERRA_v1

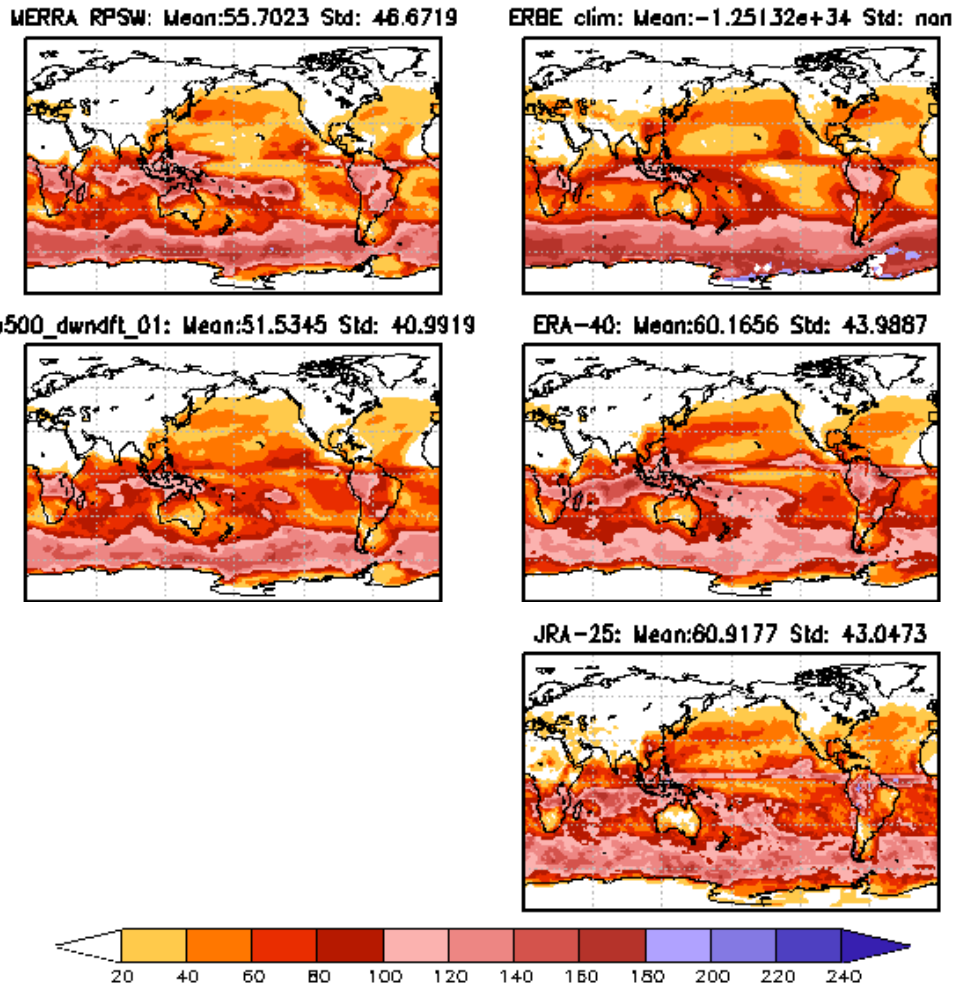


2° MERRA tests

January 2001 SW CRF (Wm^{-2})

MERRA_v0

MERRA_v1

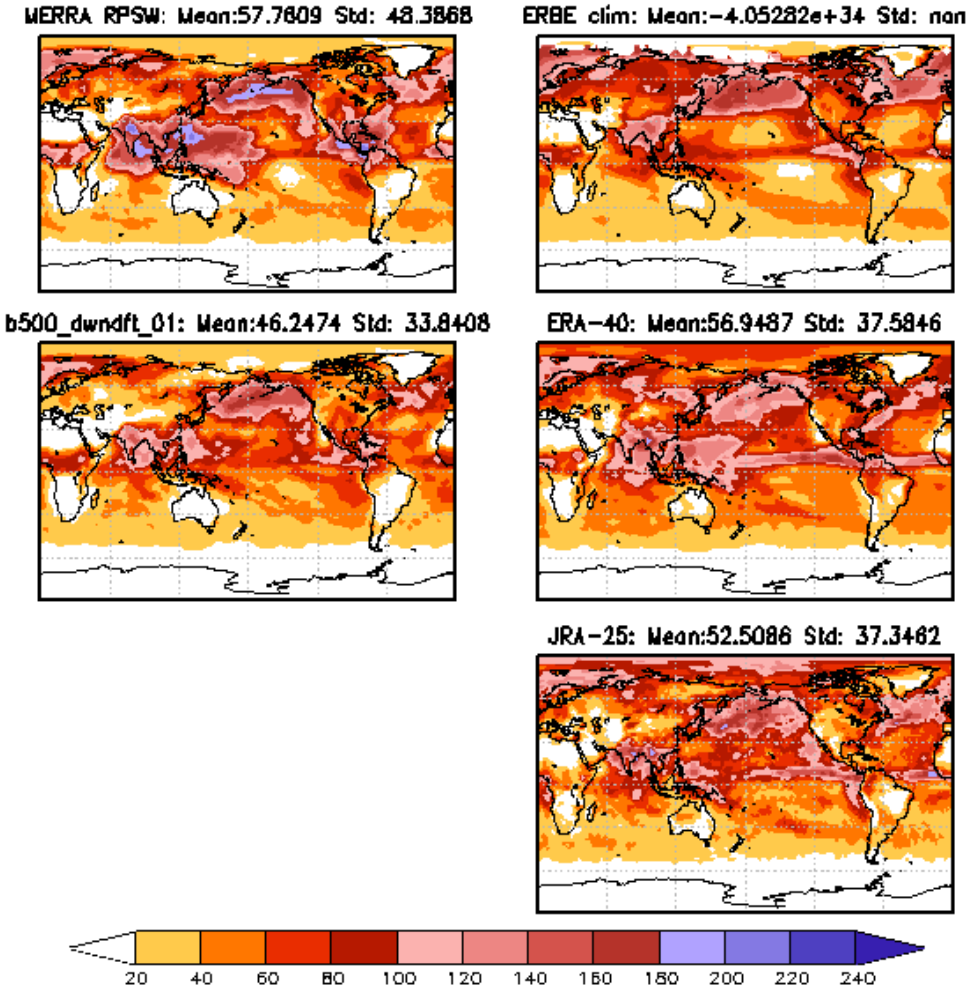


2° MERRA tests

July 2001 SW CRF (Wm^{-2})

MERRA_v0

MERRA_v1

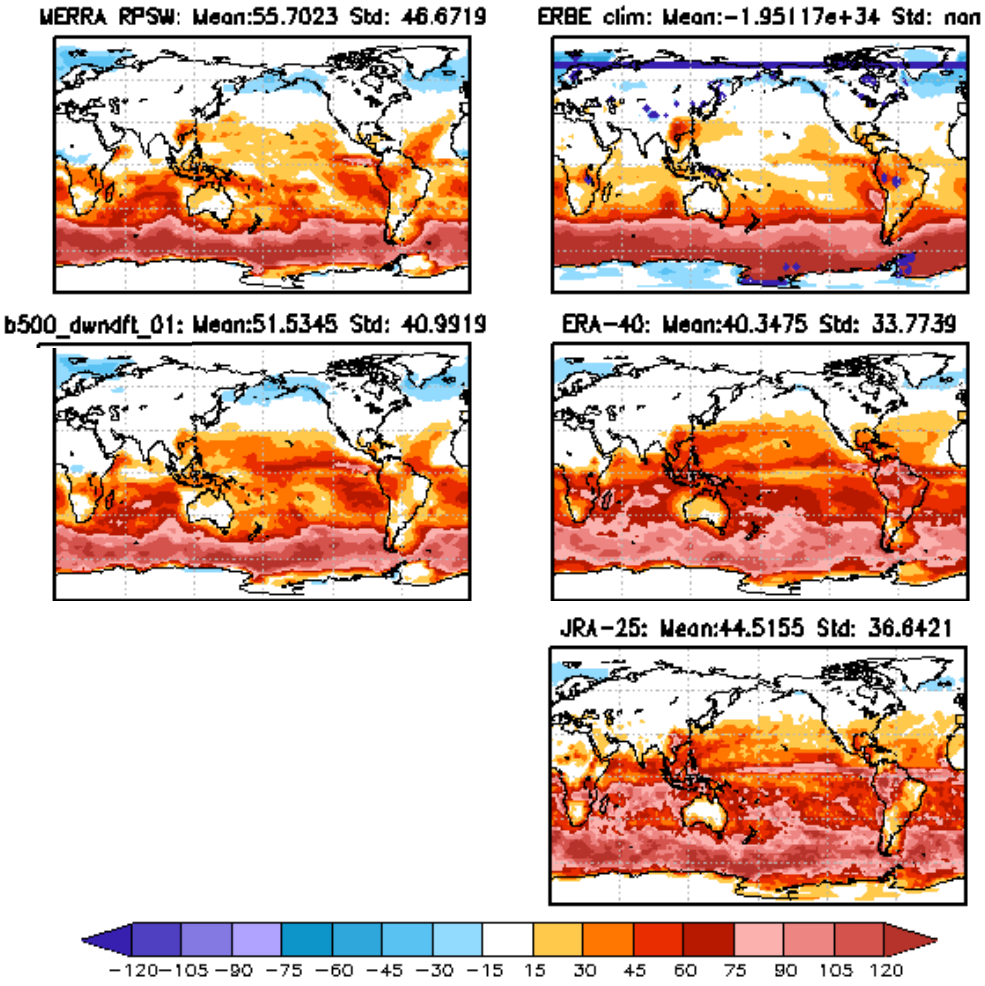


2° MERRA tests

January 2001 Net CRF (Wm^{-2})

MERRA_v0

MERRA_v1



2° MERRA tests

July 2001 Net CRF (Wm^{-2})

MERRA_v0

MERRA_v1